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HENRY SKINNER
1861-1926

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JANUARY, 1931

ENTOMOLOGICAL NEWS

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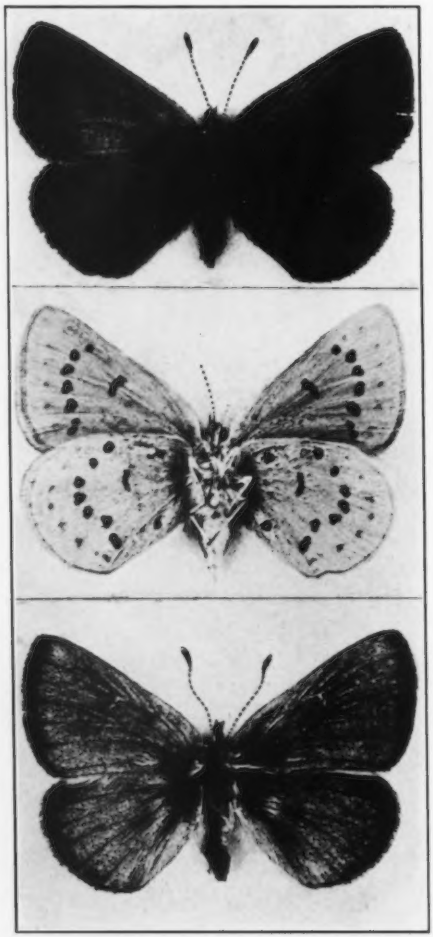

PLEBEJUS MARICOPA FENDERI.—MACY.

ENTOMOLOGICAL NEWS

VOL. XLII. JANUARY, 1931 No. 1

A New Oregon Butterfly (Lepid. Lycaenidae).

RALPH W. MACY, University of Minnesota, Minneapolis.

(Plate I).

For several seasons the writer has noted a small colony of large Blues flying about an isolated patch of *Lupinus* on a hillside six miles south-west of McMinnville, Oregon. These butterflies apparently are of a new race so I shall name it for my good friend, Mr. K. P. Fender, an enthusiastic collector.

Plebejus maricopa fenderi, f. n.

♂. *Under surface*: Primaries. Uniform bluish-gray with a very slightly heavier powdering of blue in the basal area. A semi-lunate black spot occurs at the apex of the discal cell. In the limbal area other black spots form two crescent-shaped rows of which the outer is much the less distinct—even nearly absent in one case. One each, of the spots of the inner row, occurs between the veins $R_{4,5}$ and M_1, M_1 and M_2, M_2 and M_3, M_3 and Cu_1, and Cu_1 and Cu_2. Two smaller spots occur between Cu_2 and 2nd A. Of the spots of the outer row, one each occurs between the same veins except that there is only one between Cu_2 and 2nd A, and none between $R_{4,5}$ and M_1.

Secondaries. Ground color same as that of the primaries except that the basal area is much more heavily sprinkled with blue. There is a continuation of the two rows of spots of the primaries, with spots located as follows: Inner row: one each between veins Sc + R_1 and R_s, R_s and M_1, M_1 and M_2, M_2 and M_3, M_3 and Cu_1, Cu_1 and Cu_2, and two smaller ones between Cu_2 and 2nd A. Outer row: one each between Sc + R_1 and R_s, R_s and M_1, M_1 and M_2, M_2 and M_3, M_3 and Cu_1, Cu_1 and Cu_2, and Cu_2 and 2nd A. In addition, there is an indistinct spot near the base of cell R_1. The semi-lunate spot at the apex of the discal cell is much less distinct than it is in the front wing.

Upper Surface. Blue, shading into a broad, dark-gray marginal border. The blue scales tend to be scattering.

♀. *Under Surface*: Primaries. The markings are the same as in the male except slightly heavier.

Secondaries. Light creamy-tan. All of the spots are much heavier but are arranged as in the male, with these exceptions: the two spots of the inner row between Cu_2 and 2nd A are fused, and there is a distinct dark spot in the basal area between veins 2nd A and 3rd A.

Upper Surface: Bronze, shading into a dark-gray border on the outer margin. A fairly distinct semi-lunate spot occurs at the apex of the discal cell of the fore wing.

Both sexes have a fine black line extending along the edges of the outer margins of the hind wings, and there is a white fringe on both wings.

Expanse: males, 31mm.; females, 31 to 33mm.

Type: ♀, Plate I, fig. 2. *Allotype*: ♂, fig. 3. *Paratypes*: 1 ♂, 1 ♀, fig. 1. All taken by the author at a location six miles S.E. of McMinnville, Oregon, May 25, 1929, and are now in his collection.

Explanation of Plate I.

Plebejus maricopa fenderi, f. n.

Fig. 1.—Paratype. Female, upper surface.
Fig. 2.—Type. Female, under surface.
Fig. 3.—Allotype. Male, upper surface.

Unusual Numbers of Diapheromera veliei Walsh (Orth.: Phasmidae).

The prairie walking stick, *Diapheromera velici* Walsh, was found in almost incredible numbers on July 25, 1930, in the sandhill region just north of Hardin, Colorado. The vegetation was literally covered with them and they were also numerous on the ground. From one clump of red top grass about twelve inches in diameter the writer picked nine individuals, five of which were females and four males. Over the entire area the males and females seemed to be in approximately equal numbers. Many were copulating. The insects were observed to cover an area of nearly a mile square and probably could have been found in these numbers over a much larger area.

Hugo G. Rodeck, University of Colorado, Boulder, Col.

Notes on the Abstersa-Group of the Genus Tephritis, and a Description of a New Species from California (Diptera: Trypetidae).

By Ezra T. Cresson, Jr.

In determining some material submitted by Mr. K. L. Wolff of the California Horticultural Commission, collected by him and his associates in their work on the insects of the cockleburr, *Xanthium canadensis,* two interesting species of this genus were encountered. One of these proved to be a species described from California in 1868, but has since been considered a synonym of a well-known eastern species. The other is here described as new.

Tephritis abstersa (Loew)

1862. *Trypeta abstersa* Loew, Berl. Ent. Zeit., vi, p. 221. (Cent., II, 77.)

1873. *Trypeta abstersa* Loew, Mon. Dipt. No. Am., iii, p. 322, pl. 11, fig. 7. (Urellia.)

This species is typical of a group in the genus *Tephritis,* particularly characteristic in having the radiation of the infuscated area of the wings producing two hyaline costal wedges in the marginal cell, two in the apex of submarginal cell, one in apex of first posterior and three in the second posterior cells; a small drop in the apex of the marginal cell is also characteristic and appears to be constant, as I have no records of its absence. The ray to the almost hyaline stigma is narrow and extends from the anterior crossvein to the tip of the first vein; the inferior basal portion of the wings is more or less distinctly maculated.

This species was originally described from "Amer. boreal.", probably from Eastern United States. It is entirely yellow with some infuscation on the thorax and apical portions of the abdominal segments; the third antennal segment in both sexes is yellow, scarcely longer than broad, rounded apically; the face is scarcely longer than broad, and the mesonotum is scarcely darker than the humeri. The wing is well figured by Loew.

In his redescription of this species in 1873, Loew included

material from Cuba which he supposed to be the same species, but it is probable that this was not the case. He states that "they are somewhat smaller, have a more extended blackish coloring, and the incomplete gray reticulation of the proximal half of the wing is considerably darker towards the posterior margin."

Of this species I have seen material from: Swarthmore, Pennsylvania, August 5, 1906 [1 ♂]; Manahawkin, New Jersey, September 5, [1 ♂]; Riverton, New Jersey, July 18, [1 ♂].

TEPHRITIS ACUTANGULA (Thomson)

1868. *Trypeta acutangula* Thomson, Eugenies Reise, Dipt., p. 583.
1890. *Euaresta abstersa* Coquillett, Jour. N. Y. Ent. Soc., vii, p. 265 [not Loew].
1907. *Euaresta abstersa* Cresson, Trans. Am. Ent. Soc., xxxiii, p. 106 [not. Loew].

Coquillett considered this species synonymous with *abstersa,* with which treatment I do not concur although it is not improbable that it may prove to be a subspecies or a variety. It is a darker species with very little yellow on the body, and may be described as follows:

Black; head except occiput and sometimes third antennal segment, humeri, scutellum apically, halteres, squamae, and legs, yellow. Basal portion of the arista also pale. In the darker forms the bristles of the head (except postorbital cilia), of mesonotum, humeri, notopleura, and scutellum, are black; all pile and other bristles are white, although some flexor bristles of the femora may be dark. Thorax and abdomen densely cinereous, almost obscuring the black ground color. Face generally longer than broad, and third antennal segment somewhat longer than broad, generally with an acute superior apical angle.

This form seems to have quite an extensive range west of the Mississippi River, from Dakota to Southern California. It is noticed that the California specimens have the third antennal segment generally dark, which is not the case with those from other localities I mention. Of this species I have seen material from:

Dakota: no data, [1 ♀].

Minnesota: no data, [1 ♂, 1 ♀].

Texas: El Paso, April 4-5, (Viereck & Rehn), [1 ♂, 2 ♀]. Ysleta, April 2, (Viereck & Rehn), [1 ♂, 1 ♀].

New Mexico: Alamogordo, April 22 to June, (Viereck & Rehn), [3 ♂, 2 ♀]. Beulah, August 17, (Skinner), [1 ♂, 2 ♀]. Cloudcroft, May 24, (Viereck & Rehn), [1 ♂].

California: Beverly Hills, September 13, (J. C. Menzies), [Cal. Hort. Comm., 1 ♀]. Claremont, (Baker), [1 ♀]. Pasadena, April 6-11, (K. L. Wolff), [Cal. Hort. Comm.; 2 ♂, 2 ♀].

Tephritis wolffi new species.

Identical with *Trypeta tenera* Loew of Europe in wing pattern, but differing mostly in having the third antennal segment of the male black.

♂. Head quadrate in profile, with eyes slightly vertical. Cheeks narrow, scarcely as broad as third antennal segment. Frons slightly turgid, prominent at antennae; parafrons broad with two frontorbital bristles. Face falling vertically, with epistoma not prominent. Mesofrons yellow to orange; orbits, face, cheeks and occiput much paler, whitish. Second antennal segment brown; third black, elongate, tapering apically; arista with basal third white and yellow. Thorax black, densely cinereous, with pale pubescence and hairs. Scutellum pale apically, with four bristles; apical pair short. Abdomen rather cylindrical, with pale hairs and pubescence; bases of the elongate sixth segment and lateral basal angles of the others, dark. Legs pale; fore femora noticeably thickened. Length, 3 mm.

♀. Similar, with third antennal segment tawny; bases of fourth to sixth abdominal segments black; ovipositor segment conical, turgid and polished black.

Type.—Male: Pomona, California, (K. L. Wolff; September 12, 1930), [A.N.S.P., no. 6390]. *Paratypes.*—3 ♂, 4 ♀: topotypical. 1 ♂, Visalia, California, (Culbertson); [A. N. S. P.]

Two males in poor condition from Lemon Cone, Tulare County, California, 500 ft. alt., (J. C. Bradley; July 9-11, 1907), [Cornell], are apparently conspecific with the above type series.

Change of Address

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Typha Insects and their Parasites.

By A. C. Cole, Jr.
Ohio State University, Columbus.

Very little has been written concerning the insect fauna inhabiting *Typha,* or cat-tails. The most complete paper on the subject is that of Claassen (1921), in which he lists the species that he found under their respective orders and relates them, either directly or indirectly, to their environment. Several papers have been published on the taxonomy, morphology, and biology of the species considered individually. In order to conduct an adequate survey of this group of insects many consecutive years of study are required. Several of these species have secondary hosts and alternation of generations is not unlikely.

This paper is merely a list of the insect fauna of *Typha,* together with habitat notes and a small amount of life-history data compiled after a four-year survey of the group. In view of the fact that Claassen discusses the biology of a great many of these insects, no attempt will be made here to consider this phase.

Several areas were selected from each desirable locality in which to conduct the work. Such areas were, for the greater part, typical of that section of the country in which the insects lived. They were as follows:

Monroe, Michigan—The River Raisin, which flows through the town, is bordered on both of its banks by large areas of *Typha latifolia.* This proved to be an ideal collecting spot for the year of 1927. Due to a flood in the spring of 1928, which destroyed a large part of the plants and killed most of the insects, collecting in this region had to be almost entirely abandoned. One mile east of Monroe one finds the shores of Lake Erie with its many acres of swampland. Such a location was especially well suited for this work inasmuch as most of the *Typhae* were concentrated in large beds of pure stands of *Typha latifolia.* In the center of a wood within the town limits is a patch of *Typha angustifolia* which netted several additional insects.

Bolle's Harbor, Michigan, located on the shore of Lake Erie and about five miles southeast of Monroe, made a comparatively good collecting ground, although the proportion of *Typha* to other plants in the association was not large. Only *Typha latifolia* was to be found at this location.

Columbus, Ohio, has a few small patches of cat-tail along one of its rivers, the Olentangy. These areas are small and somewhat isolated from other plants of the typical pond association.

St. Marys, Ohio—Along the St. Marys River may be found several long areas of *Typha latifolia* in which one finds a number of insects. The river is quite narrow throughout the length of its course and the collector may wade from one bank to the other.

Roberts, Idaho—Five miles north of this town the author collected a few cat-tail insects in a large swamp harboring *Typha latifolia* and *Typha angustifolia,* in the summer of 1929.

Bozeman, Montana — At approximately five miles north of the city of Bozeman is a patch of *Typha latifolia* from which a few insects were collected in the summer of 1929.

Everglades, Florida—Along the Tamiami Trail in southern Florida are huge areas of *Typha latifolia* and *angustifolia,* in many cases intermingled. Insects were collected from this locality during the winter of 1930.

Yankeetown, Florida, situated on the Gulf in Northwestern Florida has several cat-tail swamps nearby from which cat-tail insects were collected by the author during the winter of 1930. The greater part of the *Typha* at that point belongs to *latifolia.*

The only plants taken into consideration in this study were the two species of *Typha,* namely, *latifolia* and *angustifolia.* By far the greater portion of the insect fauna was reared from the former, this being the commonest species and the most succulent. In most cases the two species were found independent of one another, but in several instances were intermingled.

Typha is widely distributed throughout the United States and is found most abundantly in pond associations. It is often the most common vegetation bordering inland lakes, and its

tall, swaying leaf-blades are not easily confused with other plants.

The author confirms the statement of Claassen that "where cat-tails are not so abundant, a higher percentage of infestation usually occurs, which renders it much easier to obtain material".

Inasmuch as *Typha* insects for the greater part require moist, warm conditions for development, a duplication of these factors is essential for rearing the insects.

From this study of cat-tail insects many interesting points have developed. For instance, in an article published by the author in ENTOMOLOGICAL NEWS (1930) the stable fly has been reported parasitic on a large Lepidopterous borer in the stalks of *Typha latifolia*. This insect has rarely been recorded as a parasite. It has been reported by Breakey in the *Annals of the Entomological Society of America* for 1929 as parasitic on the iris borer, *Macronoctua onusta* Grote.

Many Lepidopterous larvae found inhabiting *Typha* have been confused with the European corn borer. Several of these larvae have been brought to Government laboratories, often by irate farmers who report cat-tail swamps as a source of all the corn borers infesting their nearby fields. The European corn borer has never been officially reported from *Typha* and the author has been unable to rear this species on any type of cat-tail. According to experiments and observations by the author the larvae will not feed on any part of the plant.

With a very few exceptions cat-tail insects seem to be universal in their distribution. According to the author's observations the most common insect inhabiting *Typha* is *Arsilonche albovenosa* Goeze. This species has been recorded from a great many sections of the United States and from both species of *Typha*.*

* The author wishes to express his appreciation to Dr. D. M. DeLong, of the Ohio State University, for his advice and criticisms. Also to the following specialists of the U. S. National Museum at Washington, D. C.: Dr. R. A. Cushman and Dr. A. B. Gahan, Hymenoptera; Dr. J. M. Aldrich and Dr. C. T. Greene, Diptera; The late Dr. H. G. Dyar, Dr. Carl Heinrich and Dr. A. Busch, Lepidoptera; Dr. E. A. Chapin, Coleoptera; Dr. A. N. Caudell, Orthoptera; Dr. P. W. Mason, Thysanoptera.

LEPIDOPTERA & PARASITES.

(1) ARSILONCHE ALBOVENOSA Goeze. Two larvae were collected at Monroe, Michigan, July 10, 1927. Both of them pupated on July 13 and both emerged on August 1; one male and one female. The larvae were found feeding on the Typha leaves leaving only the midrib intact.

From this species were reared, at Monroe, Michigan: (2) *Blacus sp.* and (3) *Microbracon sp.*, larval parasites, and (4) *Macrocentrus ancylivora* Roh. and (5) *Pimpla inquisitoriella* D. T., pupal parasites, all determined by R. A. Cushman of the U. S. National Museum.

Twenty parasites emerged from a larva of *albovenosa*, collected from the leaf of *Typha latifolia*, five miles north of Bozeman, Montana, on August 14, 1929. These were identified by R. A. Cushman as (6) *Rogas stigmator* Say. The host larva was found in a large patch of *Typha latifolia* which showed very little leaf damage. The new stalks were headed and the old stalks fire-burned.

(7) *Exorista larvarum* L., determined by Dr. J. M. Aldrich, was collected from a larva of *A. albovenosa*, ten miles north of Roberts, Idaho, on August 15, 1929. The insect was taken in the larval stage and it pupated externally. Its host larva was found on *Typha latifolia*.

Numerous larvae of *A. albovenosa* were collected on *Typha angustifolia* in the Everglades of Florida, February 28, 1930. Most of them were on or near the tips of the leaves of the old stalks only. No larvae were present on the young, immature stalks and they showed no damage. A few pupae of this insect were also collected from the exterior of mature stalks.

A few larvae of *A. albovenosa* were collected from the leaves of *Typha latifolia* at Yankeetown, Florida, on March 6, 1930. Most of them were ready to undergo pupation and none of those collected were parasitized.

(8) *Alciodes intermedius* Cress. is reported by Claassen as parasitic on *albovenosa*.

(9) APATELA OBLINITA Abbot & Smith. Two larvae, collected on *Typha* leaves at Monroe, Michigan, July 15, 1927, pupated on August 21, and emerged as males on August 29.

Two parasitized larvae were also collected, from which emerged (10) *Sceliphron caementarium* Drury* and (11) *Casinaria genuina* Nort., both specimens determined by R. A. Cushman.

* Although a parasitic habit of this species has heretofore been unknown, the author reared it under isolated laboratory conditions during which there was no opportunity for error.

(12) ENDOTHAENIA HEBESANA Wlk. At Monroe, Michigan (1927) larvae were found feeding on the seeds of *Typha latifolia*. From sixteen larvae only twelve pupated and ten emerged. (13) A *Microbracon sp.* determined by R. A. Cushman was collected in the larval stage.

(14) LYMNAECIA PHRAGMITELLA Staint. Twenty larvae were collected in heads of *Typha* on July 16, 1927, at Monroe, Michigan, from which nineteen pupated and seventeen emerged.

(15) *Elachterinae* sp. is reported by Claassen as a parasite of *phragmitella*.

Parasites. Parasites of the various *Typha* insects are listed under their hosts.

(16) COLEOPHARA sp. A great number of these small larvae were found burrowing in dried stalks of *Typha latifolia* at Monroe, Michigan, in the early spring of 1927. Their life history seems to correspond to that of *Lymnaccia phragmitella* Staint. as related by Claassen (1921).

(17) NONAGRIA OBLONGA Grote. Three larvae were collected from overwintering stalks of *Typha latifolia* in a pond near the Olentangy River at Columbus, Ohio, December 31, 1929. They were all above the surface of the ice, varying in distance from one to six inches. They appeared to be quite dormant at the time of collecting. Eighteen stalks were opened, only seven showing damage. Two more larvae were dissected out on January 19, 1930, from the same locality. Fifty stalks were opened, twelve showing damage. It seems that infestation by this insect occurs among the smaller and younger plants and not in those which have headed. In only very few cases have full grown stalks been found attacked. The larvae collected were encased in ice and, inasmuch as the minimum temperature for the preceding night was 8° F. below zero, appear to be quite resistant to low temperatures *providing* they are within the stalks. If a larva be removed from the stalk and placed, exposed, on the surface of the ice, a quick drop from freezing to zero is sufficient to cause death.

(18) *Apanteles cincitiformis* Vier. is reported by Claassen as a parasite of *oblonga*.

(19) NONAGRIA SUBFLAVA Grote. Larvae of this insect were found feeding on leaves of *Typha latifolia* in the Florida Everglades on February 28, 1930. The leaves showed about 100% infestation. Several pupae and pupal cases were also found but the majority of the insects were in the larval stage. Holland gives a very good description of this insect in his Moth Book (1913).

(20) ARCHANARA SUBCARNEA Kell. At Toledo, Ohio, on July 27, 1928, the author collected two larvae and two pupae

in stalks of *Typha latifolia*. An adult emerging from one of the pupae was determined by the late Dr. H. G. Dyar. From twenty larvae collected near Toledo, two species of parasites (21) *Muscina stabulans* Fall, and (22) *Masicera senilis* Mg., were reared, both being determined by Dr. J. M. Aldrich. At Bolle's Harbor, Michigan, near Monroe, larvae and pupae of this insect were collected on August 16, 1928, from which also emerged specimens of *Masicera senilis* and *Muscina stabulans*.

There seemed to be a heavy infestation of this insect near Toledo, Ohio, but near Monroe, Michigan, twenty miles north and on a mile stretch of Lake Erie only one individual was collected from approximately 1000 stalks. On December 27, 1928, a larva of *A. subcarnea* was taken from a stalk of *Typha latifolia* in a pond along the Olentangy River at Columbus, Ohio.

Typha latifolia was examined at Saint Marys, Ohio, on July 29, 1928, and several pupae were found in the base of the stalks, some of them submerged in water. Adults reared from these specimens were determined as *subcarnea* by Dr. Dyar.

Arzama obliqua Walk. This name is in all probability a synonym of *Archanara subcarnea* Kell. inasmuch as its description and life-history as described by Claassen agree with the latter.

(23) *Sturmia nigrita* Town. Reported by Claassen (1921). This insect is parasitic on the larvae of *Arzama obliqua*. One adult was reared at Roberts, Idaho, on August 16, 1929.

(24) BACTRA MAIORINA Hein. An adult of this species emerged from the head of *Typha latifolia* at Monroe, Michigan, on June 21, 1928, and was determined by Dr. Carl Heinrich. Nothing is known of its habits.

(25) CACOECIA ROSACEANA Harr. One specimen emerged from a pupa in a stalk of *Typha latifolia* at Monroe, Michigan, and was determined by Dr. A. Busck.

(26) UNIDENTIFIED LEPIDOPTERON. An undeterminable larva was found feeding on the leaves and tender stalks of *Typha latifolia* at Monroe, Michigan on August 12, 1928. A species of Hymenopterous parasite emerged from this larva on August 15 (two males and three females) which were determined by A. B. Gahan as (27) *Eulophus* sp.

(28) ARCHIPS OBSOLETANA Walk. Larvae of this insect were found feeding in the head of *Typha latifolia* at Monroe, Michigan, at Bolle's Harbor, Michigan, and at Toledo, Ohio, in 1927 and 1928.

(29) DICYMOLOMIA JULIANALIS Walk. This species is described by Claassen as feeding in the head of *Typha latifolia*.

(To be continued).

A New Melitaea from Oregon (Lep.: Nymphalidae).

By R. A. Leussler, Omaha, Nebraska.

Melitaea hewesi n. sp.

♂. Expanse 40 mm. (centre of thorax to apex x 2) *Upperside:* Primaries, marginal row of straight, narrow, fulvous spots edged with black; submarginal row of creamy, fulvous-tinged spots, all more or less triangular with the base slightly convex, those between veins 1 & 2 and between 2 & 3 being largest; inside submarginal row there is a row of smaller irregular shaped spots somewhat more fulvous; and inside this row an irregular row of lighter spots; a light colored bar in the cell, a similar colored spot below it near costa, and another in cell near base, a few darker fulvous spots separating the light spots from each other; the space between all of the various spots on the entire wing filled in with black; fringes pale cream, broadly cut by black at the veins, giving the appearance of a checkered fringe.

Secondaries, marginal and submarginal row of spots same as on primaries, row inside submarginal row composed of dark fulvous spots, row in discal area composed of very pale elongated spots; a minute pale spot, flanked outwardly by a curved fulvous spot, in cell near base; basal area, inner margin and all the space between spots black; fringes same as on primaries.

Underside: Primaries, rather pale dull fulvous, with all of the spots of the upper side reproduced; the submarginal spots on this side are larger than on upper side and very pale cream, almost white; the marginal fulvous spots continuous, forming a narrow band, uncut by veins; fringes same as on upper side. Secondaries, marginal fulvous band as on primaries; all spots of upper side reproduced, but considerably enlarged and so pale as to be almost white; the median band encloses a series of small, pale fulvous spots or, perhaps more properly, rings (some of them being hollow in the centre); spots in the basal area separated from each other by a narrow irregular fulvous band as is usual in the genus; all the pale spots edged with black. Body, above black, beneath pale yellowish white, palpi fulvous. Antennae, black above, reddish beneath.

♀. Expanse 48 mm. *Upperside:* Strikingly different from the male, the ground color of primaries and secondaries being black, and all the spots creamy white, excepting those forming the marginal band which are reddish fulvous; median row of spots on secondaries are mere dots; fringes same as male. *Underside:* Similar to male; body and palpi same as male.

The above descriptions apply respectively to the male holotype and female allotype taken at Tygh, Oregon, about 25 miles south of the Columbia River near the Dalles in Sherman County,

June 12, 1930, by Dr. L. I. Hewes of San Francisco, for whom I take pleasure in naming the species. Besides the holotype and allotype there are before me 9 other males and 11 other females, all collected by Dr. Hewes, and I deem it advisable to record here the variation within the series. Males Nos. 1, 2, 3 & 4, Tygh, Oregon, June 12, 1930, agree with type and are designated as paratypes. Male No. 5 same date and locality shows less contrast between pale and fulvous spots on upper side of both wings, and the same is true of the under side of primaries. Male No. 6, same date and locality, is a lightly marked specimen still less contrasty. No. 7 same date and locality, although a male this specimen is in appearance the same as the female form *eremita* of *M. palla*. Male No. 8, Goodnow Hills, WASHINGTON, June 26, 1927, same as No. 7. Male No. 9, Tygh, Oregon, June 12, 1930, is an albinic specimen, all the light colored spots being white and the fulvous ones very pale. The variation in the 11 females is less noteworthy. They are all designated as paratypes. 6 were taken at Tygh, Oregon, June 30, 1929, and the remaining 5 in the same locality June 12, 1930. There is some variation in size; in 3 of the specimens the median row of spots or dots is practically obsolete; in 2 others they are slightly tinged with red; in still another all of the spots are conspicuously large and in some of the specimens all of the spots are chalk white rather than creamy white.

What relationship this species bears to other Melitaeas I cannot say. It probably is nearest to *palla* and *whitneyi*, but in my opinion is quite distinct. 2 male and 2 female paratypes in collection of R. A. Leussler at Omaha; the types and remainder of specimens returned to Dr. Hewes.

Food Requirements for the Pupation of Two Coleopterous Larvae, Synchroa punctata Newm. and Dendroides canadensis Lec. (Melandryidae, Pyrochroidae).

By NELLIE M. PAYNE.

Fifty grown larvae of each of the species, *Synchroa punctata* and *Dendroides canadensis* were collected in April, 1924, near Saint Paul, Minnesota. These larvae were separated from the

oak bark and frass in which they occurred, washed in 70% alcohol, and fed on filter paper over night. Then the larvae were placed singly in small shell vials containing sterilized oak bark free from *Armillaria nigra*, a fungus which is often present in dead and dying trees. None of these larvae pupated the first year ending April, 1925, although controls collected at the same time and fed unsterilized oak bark or rhizomes of *Armillaria nigra*, pupated and emerged as adults in the summer of 1924. The larvae which were kept on the sterilized medium were transported to Philadelphia in September, 1925, and the experiment continued.

Observations have been made on these larvae for six complete years. The experiment is now in its seventh year. Several larvae have died but the death rate has been very low after the first four years. Larvae have been removed annually or semi-annually and approximately half of them have been fed on rhizomes of *A. nigra* and half on unsterilized oak bark. After the first year larvae thus fed pupated within twenty-four hours after feeding and emerged within two weeks. Larvae removed in April, 1925, required five days in which to pupate. Temperature at which pupae were kept varied between 20-22 degrees centigrade. The following table shows the death rate and the larvae pupating after each special feeding. None of the larvae died during pupation.

	Synchroa punctata			Dendroides canadensis		
	Fed *A. nigra* or Died unsterilized			Fed *A. nigra* or Died unsterilized		
Date	in larval stage	oak bark	Number remaining	in larval stage	oak bark	Number remaining
April, 1924	0	0	50	0	0	50
April, 1925	4	5	41	5	5	40
April, 1926	1	6	34	3	7	30
April, 1927	2	6	26	2	8	20
Oct., 1927	7	3	16	0	3	17
April, 1928	0	3	13	1	3	13
Oct., 1928	0	2	11	0	3	10
April, 1929	1	2	8	0	2	8
Oct., 1929	0	2	6	0	2	6
April, 1930	0	2	4	1	2	3

Both *Synchroa punctata* and *Dendroides canadensis* normally complete their life cycle within one year. Thus the diet of sterilized food prolonged their lives to over six times the normal length. The larvae reared on the sterilized medium were

healthy and vigorous, but merely unable to differentiate. The actual chemical compound producing pupation in these two species is unknown. The sudden transformation of the old larvae indicates that the pupation-causing substance is of a catalytic nature. This catalyst may or may not be specific, since pupation could occur either by addition of unsterilized oak bark or of *Armillaria nigra* rhizomes to the diet. However the great frequency with which *A. nigra* was present in trees in which *S. punctata* and *D. canadensis* normally fed, lead the writer to suppose that the effect of unsterilized oak bark on pupation may have been due to small bits of *Armillaria* or other fungi.

Recently Uvarov [1928] has summarized the literature relating to insect nutrition. This admirable summary renders a bibliography to a brief note superfluous.

LITERATURE CITATION.

UVAROV, B. P. Insect Nutrition and Metabolism. A Summary of the Literature. Trans. Ent. Soc. London. Dec. 31, 1928. pp. 255-343.

A Recent Occurrence of Catopsilia philea Joh. in Missouri. (Lepid.: Pieridae).

An unusual capture for this part of the country was the taking of a male specimen of *Catopsilia philea* Joh. in Webster Groves, Missouri, on July 11, 1930, by Jack Neavles, a young butterfly-hunter of my neighborhood. The range of this tropical butterfly is generally regarded as extending into Texas, but there are on record occurrences of stray individuals at localities considerably farther north. In the present instance, the flight of the butterfly for so great a distance from its normal territory may be definitely correlated with the protracted hot weather that preceded its appearance here.

Cases like this, in which butterflies are observed hundreds of miles away from the localities where they are known to breed, demonstrate that butterflies are capable of flying enormous distances, and indicate a probability that such long flights may take place more frequently than has been noted by observers. They therefore deserve careful study, being important aids to the solution of some of the problems that beset the investigator of insect migrations.

HAROLD O'BYRNE, Webster Groves, Missouri.

An Additional Annotated List of the Ants of Mississippi* (Hym.: Formicoidea).

M. R. Smith, A. & M. College, Mississippi.

In a previous article (Ent. News, Vol. 39, pp. 242-246 and 275-279, 1928) 19 additional species of ants were recorded for Mississippi. The present paper lists 20 more species, thus making a grand total of 126 species which have been recorded for the state. Although a great deal of collecting for ants has been done in some parts of the state, there are other areas in which no collecting or only very little collecting has been done. When these areas are adequately scouted, it would not be surprising if the list of the ants of the state is extended to include 150 species or more.

Of the 126 species collected to date, 11 species or 8.7 percent are apparently new species. New species have been found within the following genera:—*Aphaenogaster, Stenamma, Pheidole, Leptothorax, Myrmica,* and *Camponotus* sub-genus *Colobopsis.*

The most interesting of the new species is a *Stenamma,* which is apparently distinct from anything that has yet been recorded for North America. This species is of even further interest in that the genus *Stenamma* is very poorly represented in this section of the country.

Another interesting new species is a *Colobopsis,* which is allied to *C. impressus* in the general shape of the head of the soldier (that is, with subparallel sides) yet is very distinct not only from this species but from all other *Colobopsis* that have yet been taken in North America.

Subfamily Dorylinae

107. Eciton mexicanum (F. Smith).

Wiggins. Male specimens of what is believed to be this species were taken by Mr. J. P. Kislanko at trap lights at Wiggins on the night of June 27, 1930. Our specimens agree very well with the figure of this species as given by Wheeler in fig. 11, plate 26 of the Bull. Amer. Mus. Nat. Hist. Vol. 24,

(* A contribution from the Mississippi Agricultural Experiment Station)

1908. Wheeler states, "the male of this species is easily distinguished from all the known males of the genus by the peculiar shape of the mandibles which are narrow, straight at the base and curved at the tips, with the middle of the external margin concave and a low but distinct projection on the inner margin." I am inclined to believe that this ant is the male phase of *Eciton pilosus*. *E. mexicanum* is known only from the male. The male of *E. pilosus* on the other hand is not known. My reasons for believing that the males of *E. mexicanum* are very probably the males of *E. pilosus* will be given in a forthcoming article.

108. APHAENOGASTER TEXANA var. CAROLINENSIS Wheeler. Columbus, Starkville, Greenwood Springs. The slender, yellowish-brown workers of this ant might easily be confused with the smaller workers of *Aphaenogaster fulva* or some of its forms. The head of the worker of *carolinensis* is much more slender than the head of the worker of *A. fulva*, and the posterior corners are decidedly rounder. The eyes are proportionally larger and the antennae longer.

This species was described from specimens nesting in the soil beneath stones in the open woods at Tryon, N. C. (Bull. Amer. Mus. Nat. Hist. Vol. 34, p. 414, 1915). In Mississippi I have taken the ants from the soil beneath logs and also from beneath the bark of stumps. At Columbus, Mississippi, a colony was found nesting in a pine log near a fine colony of *Euponera gilva*.

109. STENAMMA FOVEOLOCEPHALA M. R. Smith. Ackerman. Two workers of this species were collected from the sandy soil on the south slope of a thinly wooded hillside, 2 miles from Ackerman, Mississippi. Although a careful search was made for further specimens none were found. These are the first workers of *Stenamma* that have been collected in the state. To date this is the fourth species of *Stenamma* to be described for North America. The other three species are as follows: *brevicorne* and its various subspecies and varieties, *nearcticum* (which is known only from the male and female phases), and *manni* which was described by Dr. Wheeler from Mexican specimens.

This species differs from *brevicorne* and its allied forms in

the following particulars: (1) the eyes are larger; (2) the sculpturing of the head is decidedly foveolate-reticulate; (3) the rugulae on the basal surface of the epinotum are transverse; (4) the postpetiole is longer and when viewed from above subcampanulate; (5) the color is darker, almost black.

The description of this species appeared in Annals Ent. Soc. of Amer. Vol. 23, No. 3, 1930.

110. LEPTOTHORAX WHEELERI M. R. Smith.

A. & M. College, Starkville, Sturgis, Adaton. This species was recently described and illustrated in Annals Ent. Soc. of America, Vol. 22, pp. 548, 1929. The worker of this species is very closely related to the worker of *L. schaumi* and *L. fortinodis*. From these species it differs, however, in the following particulars: (1) it has longer and larger epinotal spines; (2) the thorax is not so compressed laterally and dorsally as with the species mentioned; (3) the sculpturing is much coarser.

All of the nests which I have encountered were found in cavities in live, standing trees or in logs and stumps.

111. LEPTOTHORAX (D.) PERGANDEI subsp. FLAVUS M. R. Smith.

Adaton, Longview, Starkville. This interesting species belonging to the subgenus *Dichothorax* was also recently described in the Annals Ent. Soc. Amer. Vol. 22, pp. 549-550, 1929. Although closely allied to *pergandei*, the worker can be distinguished from the worker of *pergandei* by the following differences: (1) its larger size; (2) different color (yellow); (3) less acute meso-epinotal constriction; (4) the longer, blunter, and stouter epinotal spines; (5) the much larger and more convex petiole, and the distinctly broader post petiole; (6) and by the longer, coarser, and more uneven pilosity.

All the colonies which I have seen were nesting in crevices just beneath the bark of pine stumps, usually very near the soil level.

112. LEPTOTHORAX PERGANDEI subsp. FLORIDANUS Emery.

Louisville, Blue Mountain, Ripley. According to Emery this subspecies differs from *L.* (*D.*) *pergandei* in the following particulars, namely: (1) the body is more shining; (2) the epinotum smooth and shining above; (3) the mesoepinotal con-

striction is punctulate, subopaque; (4) the petiolar node is narrower and not impressed above; (5) the postpetiole is hardly 1/3 again as broad as the petiole and proportionally narrower than in *pergandei*. Wheeler in addition states that the color, pilosity, and sculpture are the same in both forms.

Mr. S. W. Simmons, who collected the ants at two of the locations mentioned above, informs me that they were found nesting in the soil beneath logs and stones.

113. LEPTOTHORAX (D.) PERGANDEI FLORIDANUS var. SPINOSUS M. R. Smith.

Summit. This species was described in the same journal as the other species of *Leptothorax* just mentioned (p. 551). It is also a member of the subgenus *Dichothorax*. The worker differs from that of *floridanus* as follows: (1) the epinotal spines are longer and are directed more upward and outward; (2) the epinotal spines are not small or tuberculate as with *pergandei* and *floridanus*, but distinctly spinose, and longer than broad at base; (3) the pilosity is longer, coarser, and more uneven; (4) the color, although variable, is somewhat darker than that of *floridanus*.

These ants were collected from a rotting pine stump at Summit, Mississippi, the type-locality.

114. STRUMIGENYS ORNATA Mayr.

Louisville. One specimen of this ant was collected by Mr. G. W. Haug from amongst leaves and other debris on the ground in a dense growth of oak trees about 8 miles northwest of Louisville.

The worker of this species can be very easily distinguished by the exceedingly long clavate hairs which are directed upward from the surface of the clypeus. The ants appear to be rather rare in the state.

115. STRUMIGENYS CLYPEATA var. PILINASIS Forel.

Louisville. Three specimens of this species were taken by me from a small crevice in a well rotted log, lying at the foot of a hill in the same patch of woodlands as the species mentioned above.

This species can be recognized by the peculiar shape of the

head of the worker, which tapers very strongly anteriorly, thus causing the clypeus to be considerably longer than broad. The clypeus is covered with numerous erect hairs, which are not at all clavate or scale-like as in the other species of *Strumigenys*. Also the exposed sections of the mandibles are toothed internally for their entire length.

116. SOLENOPSIS PERGANDEI Forel.

Greenwood Springs, Quitman, Biloxi, Ackerman. The worker of *S. pergandei* can be distinguished from the worker of *S. molesta* as follows: (1) it is a larger species; (2) the the head is practically quadrate; (3) the node of the postpetiole is about as long as wide and more spherically shaped. The worker of *S. molesta* has a post-petiolar node, which when viewed from above appears to be wider than long. For the description of *pergandei* see Ann. Soc. Ent. Belg. Vol. 45, p. 343, 1901. The species was described from North Carolina specimens.

I have seen nests of this ant in the soil and also in crevices in rotting pine stumps. At Quitman, alate females were found in the nest on July 6th. This does not appear to be as common a species in Mississippi as *molesta*.

117. *Solenopsis globularia* subsp. *mobilensis* Creighton.

Ocean Springs, Perkinston, Pascagoula. This species was first collected at Mobile, Alabama, by Mr. W. S. Creighton of Harvard University. At the time he wrote me in regard to it, he was of the opinion that it was possibly an imported species. This species, the only form of *globularia* that I know to occur in the United States, is very distinct from our other species of *Solenopsis*. The worker can be readily recognized by its abnormally large postpetiole, which when viewed from above and behind is transversely-elliptical. The epinotum when viewed from the side is decidedly angular.

Mr. J. P. Kislanko, who collected the ants at two of the above named localities, found them nesting in wood in both instances, and seeds were observed in their nest on one of these occasions. Mr. R. P. Colmer sent in specimens from Pascagoula, which were stealing canary bird seed from a house.

118. TETRAMORIUM (TRIGLYPHOTHRIX) STRIATIDENS Emery.

West Point. A large number of workers of this imported Indian ant were collected from the brick wall of a store in the business section of West Point, by Mr. E. E. Byrd. Mr. Byrd stated that he believed the ants to be nesting in the wall as he saw numerous workers enter and leave small holes in the wall. The ants are slow moving in gait and given to sulking when touched by an object.

This is the second time that the species has ever been recorded from the United States. It was first taken in 1913 at New Orleans by Mr. E. R. Barber (Wheeler, Jour. Ec. Ent. Vol. 9, pp. 566-569, 1916). This ant, as Wheeler aptly remarks, is tending to become world-wide in its distribution. Whether it will prove a pest in the state remains to be seen.

119. MYRMICA SCHENCKI var. SPATULATA M. R. Smith.

Starkville. This, the only species of *Myrmica* that has yet been taken in Mississippi, is apparently a new one. As its name indicates, both workers and females can be distinguished from allied forms of *Myrmica* by the exceedingly large spoon or spatulate-shaped lobes at the base of the antennae. Viewed from above the margins of the lobes are very thin and somewhat reflexed. Viewed laterally the lobes form slightly more than a right angle with the base of the scapes of the antennae.

This species was found nesting in the soil in a low, heavily wooded area 5 miles west of Starkville. The area is frequently subject to overflow.

A description of the worker and female of this species appeared in Vol. 23, No. 3, of the Annals Ent. Soc. Amer. 1930.

120. PHEIDOLE LAMIA Wheeler.

Fayette. Two soldiers and a number of workers of this extremely interesting ant were collected by Mr. G. W. Haug from the soil at the base of a maple tree in the old Argentine ant area at Fayette. The soldier of this ant can be easily recognized at a glance because of its peculiarly shaped head, which is long and subcylindrical with truncated anterior portion. The soldiers are supposed to use their heads in plugging the galleries to the nest. According to Wheeler the ants are decidedly

subterranean in nature. Mr. Haug informed me that although he made a very careful search for soldiers he only succeeded in taking two specimens. Apparently the soldiers are very scarce in the nest. They may function as queens as Wheeler suggests. *Ph. lamia* was described by Wheeler from specimens collected at Austin, Texas. So far as I am aware this is the first time that the ant has been taken outside of that state.

121. DOLICHODERUS PLAGIATUS PUSTULATUS var. BEUTENMUELLERI Wheeler.

Smithville, Biloxi. The types of this species are from the Black Mountains of North Carolina. For description of the species see Bull. Amer. Mus. Nat. Hist. Vol. 20, p. 304, 1904. The worker of this species has a black head and gaster and a reddish-brown thorax. The head and thorax which bear shallow foveolae are glabrous. There are also erect hairs on the upper surface of the body.

At Smithville workers were collected from oak, hickory, and sumac where they were seeking honey dew. At Biloxi on September 5, 1929, the ants were found attending aphids on a species of grass in a marshy area, not over 125 yards from the waters of the Gulf of Mexico. Between the sheaths of the grass were found immature stages of the ants, which were covered over by fine down-like hairs that had been pulled from the grass by the worker ants. Both winged females and female pupae were found.

Subfamily FORMICINAE.

122. FORMICA TRUNCICOLA INTEGRA Nylander.

Greenwood Springs. These beautiful, robust, red and black ants were found in large numbers amongst sand, leaves, and other debris along the edge of a small stream. In this vicinity there were many elder bushes on which were numerous black aphids that the workers were busily attending. When I attempted to capture the worker ants, they hid beneath leaves and would cautiously peep out as if they were endowed with intelligence. For a description of this species see Bull. Mus. Comp. Zool. Harvard, Vol. LIII, pp. 444-445, 1913.

123. CAMPONOTUS CARYAE subsp. DISCOLOR (Buckley).

Corinth, A. & M. College. This beautiful red and black ant with emarginate clypeus is described in Proc. Ent. Soc. Phila. Vol. 6, p. 166, 1866.

Judging from our records it does not appear to be as common a species as *rasilis,* which it resembles in both appearance and habits. It can be easily distinguished from *rasilis* by the coarse, piligerous foveolae on the cheeks and clypeus of the worker and female. At Corinth a single worker was taken from the trunk of a tree in a low, heavily wooded area. At A. & M. College, Mr. J. M. Langston found one dealate female and 3 workers in a cavity in a pecan husk on the college farm.

124. CAMPONOTUS (COLOBOPSIS) OBLIQUUS M. R. Smith.

Starkville. This species is entirely distinct from any other species of North American *Colobopsis* that has yet been described. With respect to the shape of the head of the soldier (that is, its subparallel sides) it would appear to be closely allied to *C. impressus.* From the latter species it differs in the following characters: (1) its smaller size (3.5-3.75 mm.); (2) the much coarser sculpturing of the head; (3) the less concave, truncate surface of the head; and (4) in the more rectangularly shaped clypeus.

The workers of this ant were found nesting in a cavity in the husk of a hickory nut, *Caryae* sp., which was gathered in a low woodland pasture, 5 miles southwest of Starkville. To Mr. J. M. Langston credit is due for collecting this species.

The description of this species appeared in Vol. 23, No. 3 of the Annals Ent. Soc. of Amer. 1930.

125. LASIUS BREVICORNIS Emery.

Ripley. This species is apparently confined to the cooler, more northern sections of the state. Our specimens have been collected by Mr. S. W. Simmons, who informs me that this is not an uncommon ant in the area from which it is listed above. Mr. Simmons found the ants nesting in the soil in a hilly, wooded area. The worker of *L. brevicornis* can easily be distinguished by its short antennal scapes, which do not extend entirely to the posterior corners of the head. The maxillary palpi are 6-segmented.

126. LASIUS (A.) CLAVIGER Roger.

Ripley. This species is represented in our collection by a single dealate female, which was captured at the above named locality by Mr. S. W. Simmons. Although *L. interjectus* Mayr is a fairly common ant in this state, its cogener *L. claviger* for some unexplainable reason seems to be rare or absent in the areas where we have collected intensively.

The worker of *L. claviger* can easily be distinguished by the following characters: (1) the 3-segmented maxillary palpi; (2) the antero-posteriorly compressed petiole, the superior border of which is sharp; (3) by the absence of teeth on the superior borders of the mandibles; (4) by the numerous erect hairs which are widely distributed over the dorsal surface of the gaster.

The Night Flight of Diurnal Butterflies (Lepid.).

By PHIL RAU, Kirkwood, Missouri.

I was glad that Mr. Hayward was led to publish in the October NEWS the fine lot of records of the night flight of diurnal Lepidoptera, even though he thinks the data are of no scientific value. Notes of this type are valuable in the study of psychogenesis. I believe that changes in habits and eventually in morphology of species have in many cases had their inception in just such cases of digression from instinct as Mr. O'Byrne's and Mr. Hayward's data represent. When an animal behaves in a way which differs from the established habit of the species, we know there must be some cause for this digression. Such action is usually more difficult, requires more effort, than following customary routine; hence the cause must be more impelling than is outwardly apparent. I believe that these causes for digression are usually psychic in nature.

I fully agree with Mr. Hayward when he says that each record should be complete with full environmental data, but I do not agree with him when he says that the appearance of Lepidoptera on the wing at unusual times is purely accidental, that they have merely been disturbed by night prowlers. A night in the field with sleeping insects will prove to anyone that insects, especially butterflies, sleep soundly at night, and if disturbed they drop to the ground. They can easily be picked up

in the fingers, or a twig upon which they are asleep can be carried several miles without disturbing them.*

When a day-flying male *Promethea* moth† comes to the female in the cage on my roof at four a.m., (even though he is only one out of many), my interpretation is that its organ for odor perception is more highly developed than that of its companions, or its sex urge is greater than its impulse to sleep, or both. At least, its inner urge for action must be different from that of its companions. If it beats the other ardent swains in its quest for mating, or if perchance it meets a mate of like tendencies, there is ample probability that the psychic urge to this new departure will recur in the offspring. If the new habit gives the creature an advantage among its fellows, there is a chance that it may become permanent in the species. All this, of course, would be quite unthinkable if the first occurrence of the new act was purely accidental or caused by extraneous forces.

We are in the habit of thinking that night-flying moths are active at any hour of the night, and likewise day-flying moths are active during any and all hours of the day. In the paper cited, we show that each species of moths with which we worked has a very definite period of flight, which recurs once in each cycle of twenty-four hours, and if a change of this "hour" occurs in a species, we would not expect it to occur en masse, but to have its inception in one or a few individuals of the race,—just the erratic type of individuals that Mr. O'Byrne and Mr. Hayward mention.

The C. F. Adams Collection of Diptera.

A collection of Diptera, totalling approximately 12,000 specimens, has been presented to Purdue University by Dr. C. F. Adams, Director of the Bacteriological Laboratory of the Indiana State Board of Health and formerly Dean and Entomologist of the College of Agriculture of the University of Arkansas. Dr. Adams has retained the Mycetophilidae and a named set of the Culicidae, in which groups he will continue his studies.

* See Rau and Rau, The Sleep of Insects; An Ecological Study. Ann. Ent. Soc. Amer. 9: 227-274. 1916.

† Rau and Rau, The Sex Attraction and Rhythmic Periodicity in the Great Saturniid Moths. Trans. Acad. Sci. St. Louis 26: 82-221. 1929.

A New Species of Two-winged Fly belonging to the Genus Acronarista (Diptera: Tachinidae)

By H. J. Reinhard, College Station, Texas.

In 1908, Townsend established the genus *Acronarista* with *mirabilis* as the type and sole species.[1] The description was based upon a single specimen collected by the late Dr. H. G. Dyar at Palm Beach, Florida.

I am indebted to Dr. J. M. Aldrich for the opportunity of examining the type specimen now in the U. S. National Museum. The type is a male and not a female as stated in the original description. This correction has already been indicated by W. R. Thompson.[2] The species is rare among our native Tachinidae and for more than twenty years no additional specimens have been discovered.

A second species from Louisiana, described as new in the present paper, seems congeneric. It differs in having the arista situated about midway between the base and apex of the anterior ramus of the third antennal joint; in having one to three setules near the tip of the first vein; and a number of other less essential details.

Acronarista cornuta new species

Male: Front at narrowest (vertex) 0.384 of the head width in the one specimen, widening but slightly to base of antennae; parafrontals faintly pruinose subshining in certain angles, with only a few short inconspicuous hairs outside the frontal rows; median stripe brownish-black, uniform in width to triangle and slightly broader than one parafrontal; frontal bristles descending to apex of second antennal joint, the uppermost one or two pairs smaller than the preceding ones; ocellars proclinate; verticals one pair (inner) rather stout, curving backward; orbitals present (three on one side and two on other), all proclinate; face gray pollinose, very deeply excavated, the sides linear, bare, and strongly divergent downward; vibrissae large, inserted on oral margin, with only a few bristles on the ridges above; antennae reaching oral margin, basal joints short, tinged with yellow; third wholly black, deeply and broadly incised to form an anterior and posterior ramus which in profile are distinctly bowed effecting a U-shaped appearance; arista situated slightly

[1] Tax. Musc. Flies, Smith Misc. Colls., Vol. LI, p. 85.
[2] Canad. Ent., Vol. XLIII, p. 313.

nearer base than apex of anterior ramus, thickened almost to tip, penultimate joint only slightly shorter than the third; cheeks about one-sixth the eye height; proboscis short, fleshy; palpi yellow; eyes bare.

Thorax and scutellum black, dusted lightly with bluish-gray pollen, humeri more densely pollinose; mesonotum showing five indistinct dark stripes in front and none behind suture. Chaetotaxy: humeral 2; posthumeral 2; presutural 1; acrostichal 3, 1; dorsocentral 3, 3; notopleural 2; intraalar 3 (anterior one minute); supraalar 3; postalar 2; pteropleural 1; sternopleural 4 (intermediate ones small); scutellum with two lateral besides a weaker apical pair, no discals; postscutellum normally developed; calypters semitransparent, white.

Abdomen rather short and flat, basal margins of segments two to four with narrow bands of bluish-gray pollen, the remainder of these segments, including the first, shining black; first segment without median marginal bristles; second with one pair, rather small; third with a marginal row situated considerably before the hind margin; fourth with a discal row but without a distinct row of marginals.

Legs blackish, rather stout, pulvilli conspicuous but shorter than last tarsal joint; mid tibia with one bristle an outer front side; hind tibia with a sparse row of short bristles on outer posterior edge with one or two longer near middle.

Wings hyaline; the hind cross vein erect joining the fourth vein slightly before the middle between small cross vein and bend; first vein with one to three setules near the apex; third with one rather large bristle at base; fourth vein with a broadly rounded bend, curving outward near the tip leaving the first posterior cell narrowly open almost in exact wing tip; costal spine minute.

Length, 4 mm.

Female: Unknown.

Described from a single male specimen from Opelousas, LOUISIANA, March, 1897, (collector unknown) received from David G. Hall.

Type: Male, Cat. No. 43172 U.S.N.M.

This species, like the genotype, is a minute fly with the third antennal joint cleft into two rami. In profile these are less strongly bowed than in *mirabilis* and the entire joint is black. The presence of a few setules on the first vein; the elongated penultimate joint of the arista; and the insertion of the latter nearer the base of the third antennal joint do not appear to be characters of generic importance in this case.

Dynastes tityus Linn. in Delaware (Coleop.: Scarabaeidae).

From the paper by Dr. P. P. Calvert on the occurrence of this species in Pennsylvania, in the NEWS for June and July, 1930, I was especially interested to learn of the occurrence of this beetle in that state, as I have collected one male in the vicinity of Newark, Delaware, in 1927, although I can give no further data concerning it.

In the collection of the Delaware Agricultural Experiment Station, there is one specimen, also a male, dated August 7, 1929, locality Nassau, Delaware, with no collector's name attached. I think the collector was Dr. H. D. Dozier, as I remember pinning the specimen. Nassau is just this side of Rehoboth Beach, toward the southeastern end of Delaware. During collections made in Pennsylvania in 1927 and in the following year, I did not find another specimen. In the fall of 1928, I collected a number of immature and fully grown larvae of this species in the vicinity of Knoxville, Tennessee, and I was again able to obtain some this past summer (1930).

The reported occurrence of this species in Pennsylvania is of special interest; I had thought Delaware to be its northern limit.

L. CHESTER MARSTON, JR., Department of Biology,
University of Toronto.

The Composition of the Head of Insects.

In the embryo of *Carausius* (walking stick) seven pairs of coelom sacs are laid down in the head. Of these only the antennal, mandibular, first and second maxillary are preserved for any length of time. The others (labral, preantennal, intercalary) remain rudimentary. The labral and preantennal belong to the primary head region. The preantennal pair is to be considered as homologous with that so-named in *Scolopendra*. In *Carausius* the reduction of the coelom sacs proceeds from behind forward. The second maxillary coelom sacs are like those of the thorax, the mandibular are reduced to their ventral parts. The phylogenetically oldest secondary head segment is, therefore, the mandibular, the phylogenetically youngest is the second maxillary. R. WIESMANN in Leuzinger, Wiesmann and Lehmann: Zur Kenntniss der Anatomie u. Entwicklungsgeschichte der Stabheuschrecke *Carausius morosus* Br. Jena, Gustav Fischer, 1926, pages 317-318.

Additions to the Index to Vol. XLI, 1930.

Under Obituary Notices, insert Rathvon, S. S. 234. Under Personals, insert Auxer, S. 236. Under Coleoptera, insert Auxer Collection 236, *quadristriatus*, *Tropisternus* 238, Rathvon Collection 199, Raub Collection 236.

List of the Titles of Periodicals and Serials Referred to by Numbers in Entomological Literature in Entomological News.

1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annals of the Carnegie Museum. Pittsburgh, Pa.
4. Canadian Entomologist. London, Canada.
5. Pysche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Entomologische Zeitschrift. Frankfurt a. M., Germany.
15. Natural History, American Museum of Natural History. New York.
16. American Journal of Science. New Haven, Conn.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Internationale entomologische Zeitschrift. Guben, Germany.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
20. Societas entomologica. Stuttgart, Germany.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bollettino del Laboratorio di Zoologia generale e agraria della R. Scuola superiore d'Agricultura in Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
26. Entomologischer Anzeiger, hersg. Adolf Hoffmann. Wien, Austria.
27. Bolletino della Società Entomologica. Genova, Italy.
28. Ent. Tidskrift utgifen af Ent. Föreningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. The Maine Naturalist. Thornaston, Maine.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janiero. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsg. v. E. Korschelt. Leipzig.
35. The Annals of Applied Biology. Cambridge, England.
36. Transactions of the Entomological Society of London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen, Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chileña de historia natural. Valparaiso, Chile.
45. Zeitschrift für wissenschaftliche Insektenbiologie. Berlin.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington, D. C.
48. Wiener entomologische Zeitung. Wien, Austria.
49. Entomologische Mitteilungen. Berlin.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsg. v. E. Strand. Berlin.

53. Quarterly Journal of Microscopical Science. London.
54. Annales de Parasitologie Humaine et Compareé. Paris.
55. Pan-Pacific Entomologist. San Francisco, Cal.
56. "Konowia". Zeit. für systematische Insektenkunde. Wien, Austria.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.
61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
63. Deutsche entomologische Zeitschrift "Iris". Berlin.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
66. Report of the Proceedings of the Entomological Meeting. Pusa, India.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Comptes rendus hebdoma. des séances de l'Académie des sciences. Paris.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie, Leningrad, USSR.
73. Quarterly Review of Biology. Baltimore, Maryland.
74. Sbornik entomolog. národniho musea v Praze. Prague, Czechoslavokia.
75. Annals and Magazine of Natural History. London.
76. The Scientific Monthly. New York.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
80. Lepidopterologische Rundschau, hrsg. Adolf Hoffmann. Wien.
81. Folia myrmecol. et termitol. hrsg. Anton Krausse. Bernau bei Berlin.
82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
85. Genetics. Princeton, New Jersey.
86. Zoologica, New York Zoological Society. New York.
87. Archiv für Entwicklungs mechanik der Organ., hrsg. v. Roux. Leipzig.
88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v. Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
96. La Cellule. Lierre, Belgium.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
99. Mélanges exotico-entomologiques, Par Maurice Pic. Moulins, France.
100. Bulletin Intern., Acadêmie Polonaise des Sci. et des Lett. Cracovie, Poland.
101. Tijdschrift voor entomologie, Nederlandsche Entomol. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.
104. Revista de la Sociedad entomologica Argentina, Buenos Aires.

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers within brackets [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☞*Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

GENERAL.—Dimmock, G.—Obituary. By J. H. Emerton. [5] 37: 299, ill. **Enderlein, G.**—Parallelismus der erfahrungen in der belebten Natur. [Ent. Jahrb., Krancher] 40: 79-80, ill. **Fulda, O.**—Eine plauderei. [18] 24: 321-326. **Howard, L. O.**—A history of applied entomology. (Somewhat Anecdotal). [Smiths. Misc. Coll.] 84: 564 pp., ill. **Lay, G. W.**—The language of scientists. [68] 72: 567-569. **Nomenclator animalium** generum et subgenerum. Hrsg. Schulze, Kükenthal, Heider & Hesse. Bd. 3, Hyetu-Lauxanacanthis. Berlin. pp. 1619-1778. **Reed, A. C.**—Animal parasites of man and their control. [68] 72: 611-620. **Roy, E.**—L'etude des insectes. [98] 57: 209-220. **Shaw, E. L.**—Insects from Lactuca stems. [6] 38: 463-468. **Snodgrass, R. E.**—How insects fly. [Smiths. Report] 1929: 383-421, ill. **Swett, L. W.**—Obituary. By C. W. Johnson. [5] 37: 301, ill.

ANATOMY, PHYSIOLOGY, ETC. — deLépiney, J. — Note préliminaire sur le rôle de la vision ocellaire dans le comportement des chenilles de Lymantria dispar. [Bull. Soc. Zool., France] 53: 479-490, ill. **Dieuzeide, R.**—Contribution a l'etude des Néoplasmes végétaux le role des pucerons en phytopathologie. [Act. Soc. Linné., Bordeaux] 81: 160 pp., ill. **Eastham, L. E. S.**—The embryology of Pieris rapae-organogeny. [Philo. Trans. R. Soc. London] 219, (B): 50 pp., ill. **Hovasse, R.** — Marchalina hellenica (Gennadius). Essai de monographie d'une Cochenille. [78] 64: 389-449, ill. **Lespes, Regnier & Rungs.**—Contribution à l'etude des phases chez le criquet pèlerin, Schistocerca gregaria). [69]

191: 874-878. **Marcu, O.**—Beitrag zur kenntnis der stridulations-organe von Prionus coriarius. [34] 92: 65-66, ill. **Marcus, B. A.**—Untersuchungen ueber die Malpighischen gefässe bei käfern. [46] 19: 609-677, ill. **Napier, L. E.**—The artificial feeding of Sandflies. [Indian Jour. Med. Res.] 18: 699-706, ill. **Rabaud, E.**—L'instinct maternel des araignées. [Bull. Soc. Zool., France] 53: 204-210. **Rabaud, E.**—Le stationnemont de l'argiope fasciée (Argiope bruennichi). [69] 191: 878-880. **Shull, F.**—Control of gamic and parthenogenetic reproduction in winged aphids by temperature and light. [Zeit. Induk. Abstam. u. Vererbung., Berlin] 55: 108-126. **Staercke, A.**—Ein neues formicarium. [34] 92: 152-155, ill. **Sweetman, H. L.**—The external morphology of the Mexican bean beetle, Epilachna corrupta (Coccinellidae). [6] 38: 423-452, ill. **Tanner, M. L.**—Plant lice pumping in unison. [68] 72: 560. **Timon-David, J.**—Recherches sur les matières grasses des insectes. [Ann. Fac. Sci., Marseille] 4: 29-207, ill. **Toumanoff, K.**—Notes sur le gynandromorphisme chez Carausius (Dixippus) morosus. [Bull. Soc. Zool. France] 528-544, ill. **Toumanoff & Veretennikoff.**—Résultats préliminaires d'expériences d'irradiation par les rayons x sur Carausius (Dixippus) morosus. [78] 64: 495-510, ill. **Trojan, E.**—Die dufoursche drüse bei Apis mellifica. [46] 19: 678-685, ill. **Tulloch, G. S.**—Thoracic modifications accompanying the development of subaptery and aptery in the genus Monomorium. [5] 37: 202-206, ill. **Weiss, G.**—Sur certaines conditions de mort et de chez les abeilles et chez d'autres insectes en captivité. Sur les échanges gazeux des abeilles. [77] 105: 571-573; 574-576. **Welsh, J. H.**—Reversal of phototrotism in a parasitic water mite. [92] 59: 165-169.

ARACHNIDA AND MYRIOPODA.—*Jacot, A. P.—Oribatid mites of the subfamily Phthiracarinae of the northeastern United States. [Pro. Boston Soc. Nat. Hist.] 39: 209-261, ill. ***Marshall, R.**—Hydracarina from Glacier National Park. [Trans. American Micro. Soc.] 49: 342-344, ill.

THE SMALLER ORDERS OF INSECTS.—*Banks, N.—New neuropteroid insects from the United States. [5] 37: 223-233, ill. ***Ewing, H. E.**—Six new species of Mallophaga. [10] 32: 117-123, ill. **Light, S. F.**—The California species of the genus Amitermes silvestri. (Isoptera). [67] 5: 173-214, ill. **Light, S. F.**—The Mexican species of Amitermes silvestri (Isoptera). [67] 5: 215-232, ill. **Martynov, A. V.**—The interpretation of the wing venation and tracheation of the Odonata and Agnatha. [5] 37: 245-280.

ORTHOPTERA.—Johnson, C. W.—The walking-stick, Monomera blatchleyi race atlantica in eastern Massachusetts. [5] 37: 285.

HEMIPTERA.—Pack & Knowlton.—Notes on Utah Hemiptera. [4] 62: 248-250. ***Pickles, A.**—Leocomia cinchonae, sp. n., a new Ceropid from Jamaica. [75] 6: 586-589, ill.

LEPIDOPTERA.—Allen & Lott.—Epiblema strenuana, the host of certain parasites of the oriental fruit moth, Laspeyresia molesta. [10] 32: 135-136. ***Bell, E. L.**—Descriptions of new South American Hesperiidae. [6] 38: 455-460, ill. **Cook, W. C.**—An ecologically annotated list of the Phalaenidae of Montana. [4] 62: 257-264, cont. **Eidmann, H.**—Ueber den taxonomischen wert des weiblichen genitalapparates lepidopteren. [34] 92: 113-122, ill. **Ford, L. T.**—Notes on some broods of polymorphic Lepidoptera. [9] 63: 258. **Jordan, K.**—Description of new Sphingidae and remarks on some others. (S). [71] 36: 149, ill. **Lück, R.**—Die variabilität von Heliconius thelxiope in Franz. Guyana. [18] 24: 337-341. **Peter Wynne, A. S. B. F.**—Moths destroyed by bats. [9] 63: 256. **Schmith, K.**—Die Brassoliden des municips Joinville im staate Sta. Catharina, Südbrasilien. [Ent. Jahrb., Krancher] 40: 150-153.

DIPTERA.—Aldrich, J. M.—Notes on the types of American two-winged flies of the genus Sarcophaga and a few related forms described by the early authors. [50] 78, Art. 12: 39 pp., ill. (S). **Barnes, H. F.**—On some factors governing the emergence of gall midges (Cecidomyidae). [93] 1930: 381-393, ill. ***Bau, A.**—Die ausbeute der deutschen Chaco-Expedition 1925-26. Diptera. XX. Pupipara. (S). [56] 9: 209-213, ill. **Bequaert, J.**—Notes on American Nemestrinidae. [5] 37: 286-297. ***Curran, C. H.**—A new tachinid parasitic on a sawfly. [4] 62: 246-247. **Dolley, W. L.**—An entomological sheep in wolf's clothing. [Enax tenax] [76] 1930: 508-516, ill. **Duncan, F. N.**—Some observations on the biology of the male Drosphila melanogaster. [90] 64: 545-551, ill. **Hoffman, C. C.**—La distribución geográfica de los mosquitos Anopheles en el estado de Veracruz. [Dept. Salubrid Publica, Mexico] 1929: 76 pp., ill. **Hoffmann, C. C.**—Los mosquitos Anopheles transmisores del paludismo en el valle de Mexico. [Bol. Dept. Salubrid Publica, Mexico] 1929: 16 pp. **Johnson, C. W.**—A bot fly from the white-footed mouse. [5] 37: 283-284. ***Lengersdorf, F.**—Neue Sciara (Lycoria)-arten des Zoologischen Museums in Hamburg aus Borneo und Kostarika. [34] 92: 123-130, ill. **Philip, C. B.**—Supplemental note regarding mosquito vectors of experimental yellow fever. [68] 72: 578. **Tulloch, G. S.**—A key to the biting mosquitoes of New England. [5] 37:

234-244, ill. **Wentworth, C. K.**—Mosquitoes versus Culicidae. [68] 72: 579-580.

COLEOPTERA.—*Chapin, E. A.—New Coccinellidae from the West Indies. [91] 20: 488-495. ***Chittenden, F. H.**—New species of North American weevils of the genus Lixus. [50] 7, Art. 18: 26 pp., ill. **Chittenden, F. H.**—New species of North American weevils of the genus Lixus. [50] 77, Art. 18; 26 pp., ill. **Collett, H. R. P.**—The burying of carrion by Coleoptera. [8] 66: 257-258. **von Dalla Torre & Hustache.**—Coleopterorum Catalogus. Pars 113. Curculionidae: Ceuthorrhynchinae. 150 pp. **Daviault, L.**—Sur les variations des coccinelles du genre Adalia. [98] 57: 221-224. ***Fall, H. C.**—New Coleoptera XIV, with notes on known species. [4] 62: 251-257. ***Fisher, W. S.**—New West Indian Buprestidae. [10] 32: 125-129. ***Fleutiaux, M. E.**—Description d'un Melaside nouveau de la collection du Muséum National d'Histoire Naturelle de Paris. (S). [Bull. Mus. Nat. Hist. Nat., Paris] 2: 410-411. ***Funkhouser, W. D.**—New genera and species of neotropical Membracidae. [6] 38: 405-420, ill. ***Pic, M. M.**—Dascillides et Helodides nouveaux. (S). [Bull. Mus. Nat. Hist. Nat., Paris] 2: 271-273. **St. George, R. A.**—The discovery of what is possibly the larva of an introduced tenebrionid, Leichenum variegatum. [10] 32: 122-123, ill. **Williams, B. S.**—A new method of capturing Coleoptera in flight. [8] 66: 253-255.

HYMENOPTERA.—*Benson, R. B.—Sawflies collected by the Oxford University Expedition to British Guiana, 1929. [75] 6: 620-621. **Claude-Joseph, F.**—Recherches biologiques sur les friedateurs du Chile. [Ann. Sci. Nat., Paris, Zool.] (10) 13: 235-354, ill. **Constantineanu, M. J.**—Quelques anomalies chez les Ichneumonides. [Bull. Mus. Nat. Hist. Nat., Paris] 2: 557-563, ill. **Hoffmann, F.**—Ueber bienenzucht im tieflande Brasiliens, bzw. in Jaraguá. [Ent. Jahrb., Krancher] 40: 183. **Johnson, C. W.**—On the variation and abundance of Sirex nitidus. [5] 37: 281-282. ***Malloch & Rohwer.**—New forms of sphecoid wasps of the genus Didineis. [50] 77, Art. 14: 7 pp., ill. **Schmiedeknecht, O.**—Opuscula Ichneumonologica. Suppl. Bd., Fasc. 9, Platylabus, Cryptinae, pp. 5-28. ***Swenk, M. H.**—A new bee of the genus Colletes from Panama. [5] 37: 219-222. **Vandel, A.**—La production d'intercastes chez la fourmi Pheidole pallidula sous l'action de parasites du genre Mermis. [78] 64: 457-494, ill. ***Whittaker, O.**—Eight new species of Serphoidea from British Columbia. [10] 32: 129-135. **Willem, V.**—L'Architecture des abeilles. [Bull. Cl. Sci. Acad. R. Belg.] (5) 16: 893-906, ill.

ENTOMOLOGICAL NEWS for December, 1930, was mailed at the Philadelphia Post Office December 26, 1930.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Oxybelinae (Sphecidae, Hymenoptera)—Wanted from all parts of North and South America and West Indies. Will determine, exchange or purchase. V. S. L. Pate, Entomology Dept., Cornell University, Ithaca, N. Y.

Wanted—Names and addresses of collectors of insects, particularly Lepidoptera. Those from foreign countries especially invited. Will pay cash or exchange. Peter M. Casamento, P. O. Box 276, West New York, New Jersey.

Exchange—All groups of Lepidoptera in exchange for Noctuidae of the World. Foreign correspondence desired. A. Glenn Richards, Jr., Roberts Hall, Cornell Univ., Ithaca, N. Y., U. S. A.

Exchange—Lepidoptera of the Northwest for beautiful and showy exotics. C. W. Herr, Priest River, Idaho.

WANTED for cash or in exchange, hibernating pupae, especially Papilios, Saturniidae, Eacles imperialis, Autom. io and others from all parts of the States, Canada and Mexico. Send lists with best prices to Max Rothke, 1846 East Elm St., Scranton, Pa.

Mordellidae from all parts of the world wanted for special study. Will determine, exchange or purchase. Emil Liljeblad, 1018 Roscoe St., Chicago, Illinois.

Exchange—Will exchange California Butterflies for any of your locality. What have you to offer? Correspondence solicited. John Imschweiler, 748 N. Eucalyptus Ave., Inglewood, California.

Exchange—Oregon Lepidoptera for those of your locality. Kenneth M. Fender, 930 South Davis St., McMinnville, Oregon.

Exchange—Will exchange Montana Lepidoptera and Coleoptera for material of your locality. Correspondence solicited from all parts of the world. W. F. Lawrence, 2209 6th Ave. No., Great Falls, Montana.

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